



Global Nexus Institute
— Innovation & Excellence —

Professional Data Analytics



XLS

Week 1-3: Excel for Data Analytics

Week 1: Introduction to Excel and Data Manipulation



Objective

- Understand the Excel interface and navigation.
- Learn how to use basic functions and formulas.
- Apply referencing techniques in formulas.
- Use basic data manipulation techniques (sorting, filtering).

Introduction to Excel Interface and Basic Functions



- Navigating the Excel interface
- Basic functions: SUM, AVERAGE, COUNT, MIN, MAX
- Simple formulas and referencing (relative, absolute, mixed)

Data Manipulation in Excel



- Sorting and filtering data
- Conditional formatting
- Data validation and basic data cleaning (find and replace, text-to-columns)



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Week 1-3: Excel for Data Analytics

Week 2: Advanced Excel Techniques



Objective

- Create and work with PivotTables and PivotCharts.
- Learn advanced Excel functions such as VLOOKUP, HLOOKUP, and INDEX-MATCH.
- Understand how to combine multiple functions for more complex data analysis.

PivotTables and PivotCharts



- Creating PivotTables for summarizing data
- Using PivotCharts for visualization
- Slicing and filtering data in PivotTables

Advanced Excel Functions



- Using VLOOKUP, HLOOKUP, INDEX-MATCH for data lookup
- Combining functions (IF, COUNTIF, SUMIF, and their variants)
- Text functions (LEFT, RIGHT, MID, CONCATENATE, TEXT functions)



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Week 1-3: Excel for Data Analytics

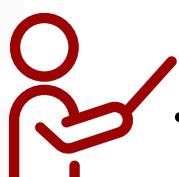
Week 3: Data Analysis and Visualization in Excel



Objective

- Analyze data with basic statistical functions.
- Learn how to visualize data with Excel charts and graphs.
- Understand how to format charts and graphs for presentations.

Data Analysis with Excel



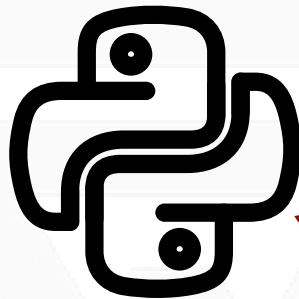
- Descriptive statistics (mean, median, mode, standard deviation)
- Analyzing correlations and trends with charts (line, bar, scatter)
- Introduction to data visualization principles

Advanced Data Visualization in Excel



- Creating advanced charts (histograms, box plots)
- Using Excel for statistical analysis (correlation, regression)
- Formatting charts for professional presentation





Week 4-7: Python for Data Analytics

Week 4: Introduction to Python Programming for Data Analysis



Objective

- Understand Python basics and how to work in Jupyter Notebooks.
- Familiarize yourself with essential Python libraries: pandas, numpy, matplotlib.
- Learn how to import and export data in Python.

Introduction to Python

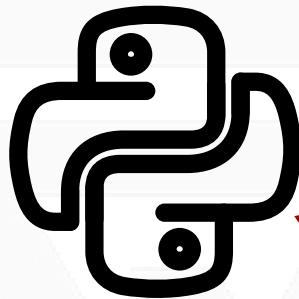


- Python basics: syntax, variables, data types, operators
- Introduction to Jupyter Notebooks for data analysis
- Working with libraries: pandas, numpy, and matplotlib

Data Structures and Basic Data Manipulation



- Lists, dictionaries, and sets in Python
- Using pandas DataFrame for data manipulation
- Data import/export (CSV, Excel files)



Week 4-7: Python for Data Analytics

Week 5: Data Cleaning and Transformation with Python



Objective

- Learn how to clean and transform data in Python.
- Handle missing data and duplicates.
- Perform data reshaping and aggregation.

Data Cleaning in Python



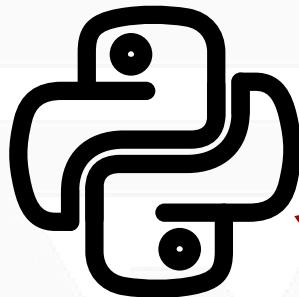
- Handling missing data: `dropna()`, `fillna()`, and `interpolation`
- Removing duplicates and outliers
- Renaming columns and data formatting

Data Transformation



- Data reshaping: `pivot`, `melt`, and `stack/unstack` operations
- Grouping data with `groupby()` and aggregating functions
- Merging and joining data from multiple sources





Week 4-7: Python for Data Analytics

Week 6: Exploratory Data Analysis (EDA) & Statistics



Objective

- Conduct exploratory data analysis (EDA) to understand data patterns.
- Understand basic statistics and data trends.

Descriptive Statistics with Python

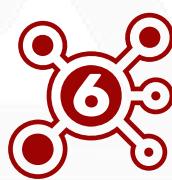


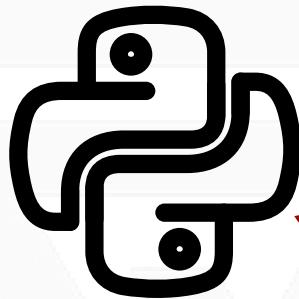
- Calculating summary statistics using pandas
- Understanding data distributions (mean, median, mode, skewness)
- Identifying correlations and trends

Working with Statistical Functions



- Computing variance, standard deviation, and percentiles.
- Performing hypothesis testing and correlation analysis.
- Introduction to statistical tests in Python.





Week 4-7: Python for Data Analytics

Week 7: Data Visualization with Python



Objective

- Use Python libraries to create various data visualizations.
- Understand visualization principles and customization techniques.

Basic Data Visualization



- Creating plots using matplotlib and seaborn (histograms, scatter plots).
- Customizing plots with titles, labels, colors, and legends.

Working with Statistical Functions



- Creating boxplots, heatmaps, and pair plots.
- Using seaborn for multi-variable visualizations.
- Interactive visualizations with plotly (optional).



Week 8-10: MySQL for Data Analytics

Week 8: Introduction to SQL and MySQL



Objective

- Understand the basics of relational databases and SQL.
- Learn how to write basic SQL queries for data extraction.
- Connect Python with MySQL to work with databases.

Introduction to MySQL

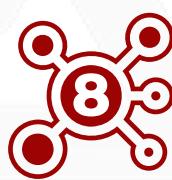


- Understanding relational databases and SQL syntax
- Setting up MySQL and connecting with Python
- Writing basic SQL queries (SELECT, WHERE, ORDER BY)

Advanced SQL Queries



- Joins: INNER JOIN, LEFT JOIN, RIGHT JOIN, FULL JOIN
- Using aggregate functions: COUNT, SUM, AVG, GROUP BY
- Using subqueries and nested queries





Week 7-9: MySQL for Data Analytics

Week 9: Data Analysis and Transformation with MySQL



Objective

- Learn how to perform complex SQL queries with multiple tables.
- Use advanced SQL functions for data manipulation.
- Work with date, time, and string functions in SQL.

Complex SQL Queries



- Using multiple tables and complex JOINs
- Subqueries and creating complex filters with SQL
- Using window functions and CTEs (Common Table Expressions)

Working with Dates and Strings in SQL



- Date and time functions in SQL
- String manipulation functions (CONCAT, LENGTH, SUBSTRING, etc.)
- Advanced aggregate functions: HAVING, RANK(), ROW_NUMBER()





Week 7-9: MySQL for Data Analytics

Week 10: Integrating MySQL with Python for Data Analysis



Objective

- Understand how to integrate Python with MySQL.
- Automate data extraction from MySQL to Python for analysis.
- Perform data transformation and ETL processes.

Python and SQL Integration



- Using Python's MySQL connector
- Querying databases and loading data into pandas DataFrames
- Automating SQL queries for data extraction and reporting

Data Transformation and ETL Processes



- Extracting data from SQL databases
- Transforming data with pandas
- Loading data into other systems (CSV, Excel, visualization tools)





Week 11-12: Power BI for Data Analytics

Week 11: Introduction to Power BI



Objective

- Learn how to connect Power BI to various data sources.
- Understand the Power BI workspace and the basic elements of a report.
- Import and clean data using Power Query Editor.



Power BI Interface and Data Connection

- Connecting to various data sources (Excel, SQL, APIs)
- Navigating the Power BI workspace
- Importing and cleaning data using Power Query Editor



Building Interactive Dashboards

- Creating basic visualizations (bar charts, pie charts, line charts)
- Setting up slicers and filters for interactivity
- Creating report pages and layout design for dashboards





Week 10-12: Power BI for Data Analytics

Week 12: Advanced Power BI Techniques



Objective

- Learn how to create complex calculations using DAX.
- Understand how to share and collaborate on Power BI projects.
- Use advanced techniques for building interactive and dynamic dashboards.



DAX Calculations and Measures

- Introduction to DAX (Data Analysis Expressions)
- Creating calculated columns and measures
- Using DAX for complex calculations (SUMX, CALCULATE, etc.)



Sharing and Collaborating in Power BI

- Publishing reports to Power BI Service
- Sharing and collaborating on Power BI workspaces
- Setting up scheduled refresh and data access security





Week 10-12: Power BI for Data Analytics

Week 13: Capstone Project (Final Week)



Objective

- Apply everything learned to a real-world data analytics project.
- Develop a comprehensive Power BI dashboard based on a given dataset.
- Present findings and insights in a professional format.

Capstone Project Kickoff



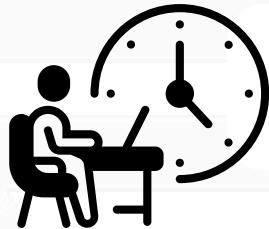
- Project introduction and data exploration
- Collect and clean data using Excel, Python, and MySQL
- Begin analysis and visualization of data

Project Presentation and Report



- Finalize analysis and create interactive Power BI dashboard
- Present project findings and insights in a professional format
- Submit final report and project deliverables for evaluation





Office Hours

Weekly (1 hour)

Available on Microsoft Team to address specific questions, provide help with assignments, and discuss project progress for online programs



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